

transforming a plant cell of said plant with an expression cassette comprising said nucleic acid sequence operably linked to a seed-specific promoter, said plant selected from the group consisting of corn, canola, wheat, barley, oats, alfalfa, soybeans and sorghum; and

recovering a genetically altered plant from said plant cell, said genetically altered plant characterized by an improved nutritional profile relative to a wild-type of said plant.

c/ 82. (new) A method for improving a nutritional profile of a plant, comprising the steps of:

selecting a nucleic acid sequence for its ability to encode an enzyme capable of modifying the utilization of an intermediate substrate in the phenylpropanoid pathway of a plant, said enzyme not naturally occurring in said phenylpropanoid pathway;

transforming a plant cell of said plant with an expression cassette comprising said nucleic acid sequence operably linked to a seed specific promoter, said plant selected from the group consisting of corn, canola, wheat, barley, oats, alfalfa, soybeans and sorghum; and

recovering a genetically altered plant from said plant cell, said genetically altered plant characterized by an improved nutritional profile relative to a wild-type of said plant.

83. (new) A method for improving a nutritional profile of a plant, comprising the steps of:

transforming a plant cell of said plant with an expression cassette comprising a nucleic acid sequence encoding a choline metabolizing enzyme operably linked to a seed specific promoter, said plant selected from the group

consisting of corn, canola, wheat, barley, oats, alfalfa, soybeans and sorghum;
and

recovering a genetically altered plant from said plant cell, said genetically altered plant characterized by an improved nutritional profile relative to a wild-type of said plant.

84. (new) The method according to claim 83 wherein said choline metabolizing enzyme is choline oxidase.

85. (new) The method according to claim 84, wherein said expression cassette further comprises a nucleic acid sequence that encodes a betaine aldehyde dehydrogenase capable of converting betaine aldehyde to betaine.

86. (new) The method according to any one of claims 81-83, wherein said substrate is not a primary metabolite of the group selected from glucose, amino acids, common fatty acids and nucleotides.

87. (new) The method according to any one of claims 81-83, wherein said seed selective promoter is a phaseolin promoter or a napin promoter.

88. (new) The method according to any one of claims 81-83, comprising the further step of:

growing said genetically altered plant under conditions that permit the formation of seed, and recovering said seed.

89. (new) A genetically altered plant or a descendant thereof, comprising a recombinant nucleic acid molecule stably incorporated into the genome of said plant, said recombinant nucleic acid molecule comprising:

(a) a seed-specific promoter; and

(b) a nucleic acid sequence operably linked to said seed-specific promoter, said nucleic acid sequence encoding an enzyme capable of modifying the utilization of an intermediate substrate in a secondary metabolic pathway associated with a nutritional profile of said plant, said enzyme not naturally occurring in said secondary metabolic pathway;

said plant being selected from the group consisting of corn, canola, wheat, barley, oats, alfalfa, soybeans and sorghum; and

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said genetically altered plant being characterized by an improved nutritional profile relative to a wild-type of said plant;

or a cell, seed or component of said genetically altered plant or descendant thereof.

90. (new) The genetically altered plant or descendant thereof according to claim 89, wherein said secondary metabolic pathway is the phenylpropanoid pathway.

91. (new) The genetically altered plant or descendant thereof according to claim 89, wherein said enzyme is a choline metabolizing enzyme.

92. (new) The genetically altered plant or descendant thereof according to claim 91, wherein said choline metabolizing enzyme is choline oxidase.

93. (new) The genetically altered plant or descendant thereof according to claim 92, wherein said recombinant nucleic acid molecule further comprises a nucleic acid sequence that encodes a betaine aldehyde dehydrogenase capable of converting betaine aldehyde to betaine.

94. (new) The genetically altered plant or descendant thereof according to claim 89, wherein said substrate is not a primary metabolite of the group selected from glucose, amino acids, common fatty acids and nucleotides.

95. (new) The genetically altered plant or descendant thereof according to claim 89, wherein said seed selective promoter is a phaseolin promoter or a napin promoter.

96. (new) The genetically altered plant or descendant thereof according to claim 89, having reduced sinapine content relative to a wild-type of said plant.

97. (new) The genetically altered plant or descendant thereof according to claim 89, having altered lignin content relative to a wild-type of said plant.

98. (new) An animal feed derived at least in part from the genetically modified plant or descendant thereof according to claim 89, or from a cell, seed or component thereof.

REMARKS

Claims 81-98 remain in this application. Claims 34-38, 40-46 and 48-80 have been cancelled. New Claims 81-98 have been added. Attached hereto is a marked-up version of the changes made to the claims by the current amendment. The attached page is captioned "Version With Markings to Show Changes Made".

Applicants note that the Office Action Summary attached to the Office Action of June 24, 2002 contains an error. The Office Action refers to claim 81. Applicant believe this to be incorrect, as the highest claim number previously used is claim 80.

The new claim set includes three method claims drawn in independent form (new claims 81-83) and one product claim drawn in independent form (new claim 89). The remaining claims depend from one of these independent claims.

Claims 81-83 are directed to a method for improving a nutritional profile of a plant, and claim 89 is directed to a plant having an improved nutritional profile, like the claims of record.